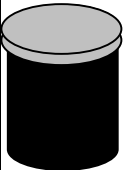
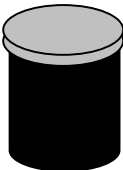
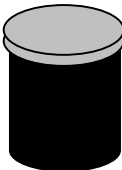
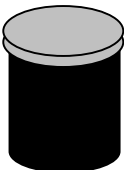
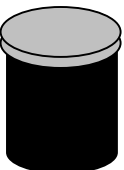
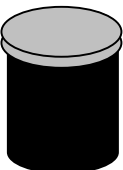




Name: \_\_\_\_\_

### Closed Mystery Cans

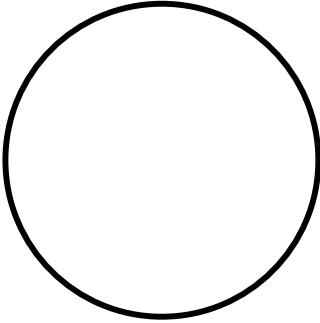
Observe the **closed** cans and record as many properties of the materials from each can in the correct column. Predict what each can might contain, and write it in the box below each numbered can.

	1	2	3	4	5	6	7	8
Property								
Mass In Grams								
Slides								
Rattles								
Sloshes								
Rolls								
Silent								
I predict the object in the can is								

## Three Groups of Materials in Closed Cans

Classify the film cans into three groups. Write the numbers of the film cans that are grouped together in each circle. List the **properties** you used to classify the members of each group on the lines next to the circle.

Group 1



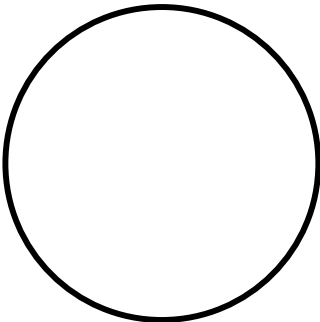
Properties

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Group 2



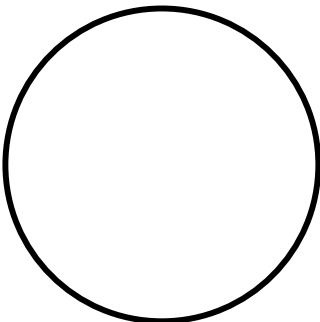
Properties

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Group 3



Properties

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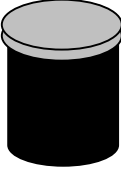
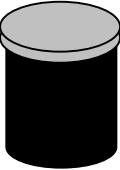
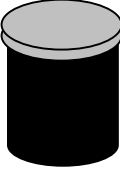
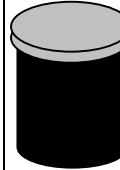
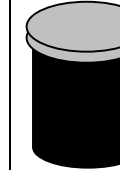
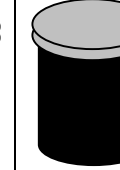
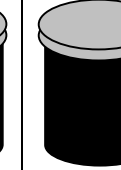
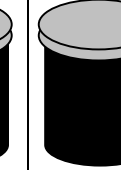
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Name: \_\_\_\_\_

## Open Mystery Cans

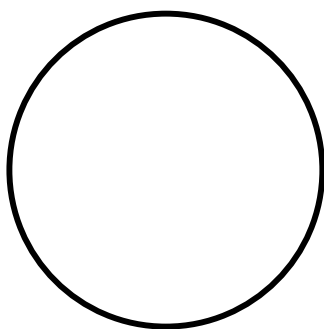
Pour the material in each can onto the tray. Record the properties of the materials from each can in the correct column. Write the name of the object in the box under each can. Were your predictions correct?

Property	1 	2 	3 	4 	5 	6 	7 	8 
Piles up								
Shape								
Color								
Texture								
Mass								
Hardness								
Rolls								
Slides								
Piles up								
Flows								
Spreads out								
Object								

## Three Groups of Materials in Open Cans

Write the numbers of the film cans that are grouped together in each circle.  
List the **properties** you used to classify the members of each group on the lines  
next to the circle. Did your classification change?

Group 1



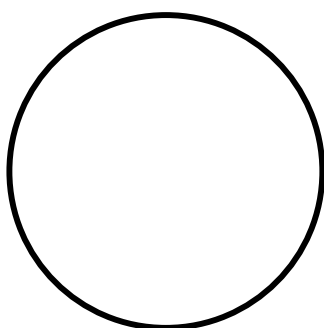
Properties

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Group 2



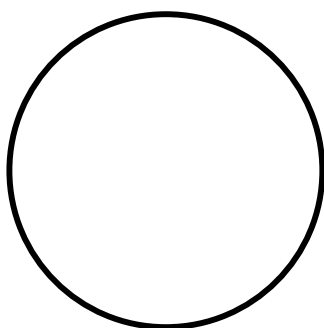
Properties

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Group 3



Properties

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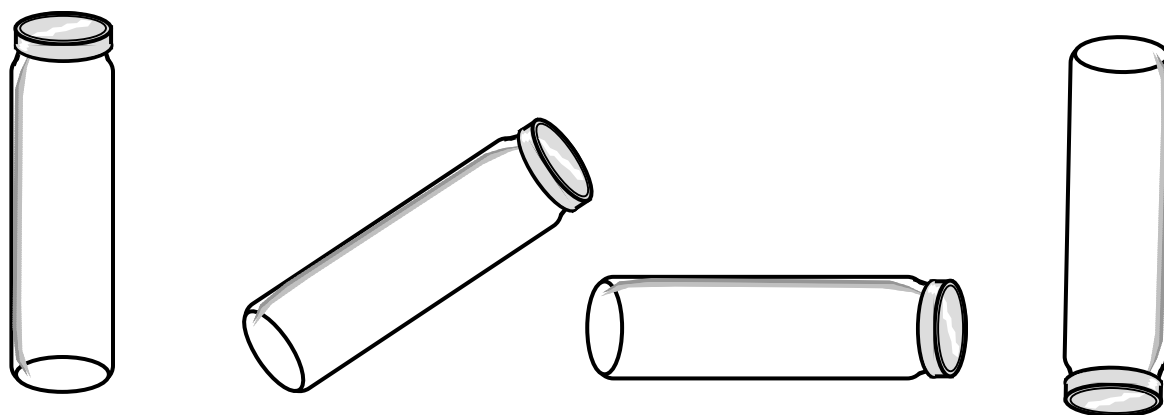
## Station 1: Soft Shapes

Materials: play dough in container, marble, tray

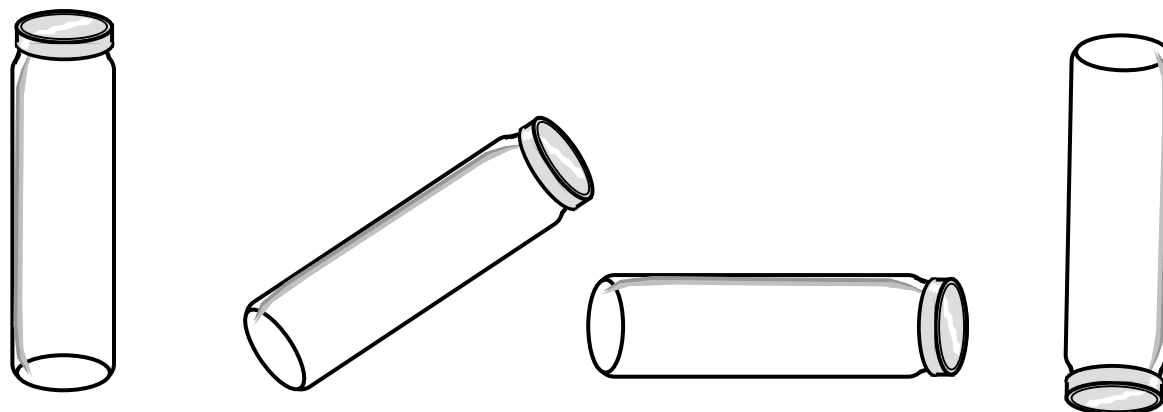
1. Open the play dough container, tip it upside down, and allow the ball of clay to fall into the tray.
2. Did the shape of the clay remain the same when it changed containers?
3. Press on the clay to make it a flat pancake. Does it keep this shape after you stop pressing on it?
4. Place the flattened clay into the container. Tip the container upside down, and allow the clay pancake to fall into the tray. Did it change shape when it changed containers?
6. Why can we press clay into a new shape? What might happen if we try to change the shape of a marble? Try to change the marble's shape, and describe what happens.
7. Which properties of a marble and a ball of clay are alike?
8. Which properties of a marble and a ball of clay are different?

## Station 2: Tip It, Turn It

A. Observe the positions of the bottles below. Predict and draw what each bottle will look like if it is half full of water.



B. After making your predictions, fill a jar half full of water, and observe the bottle in each of the positions shown. Draw how the liquid looks in each bottle position.

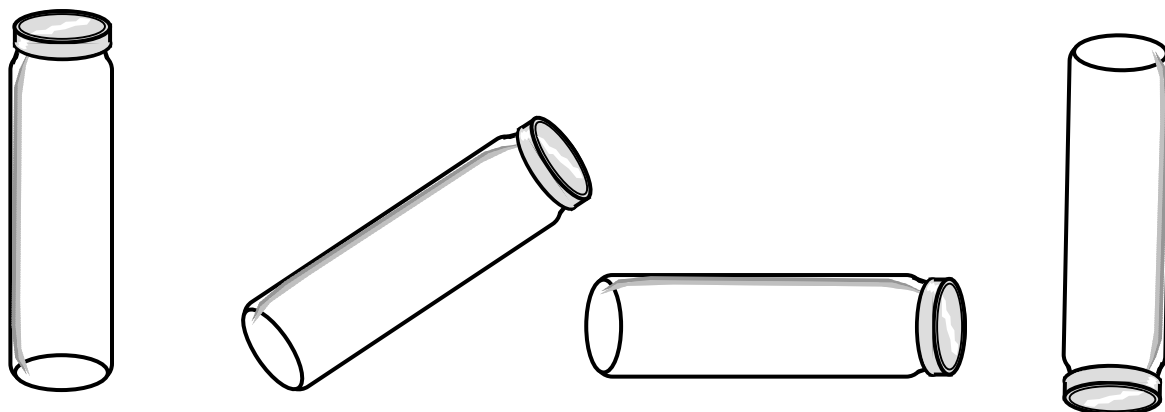


Compare the drawings in Part A and B. Were your predictions correct?

### Station 3: All Bottled Up

Materials: Bottles A, B, C, and D

Observe the materials in the bottles. Tip the bottles in the positions that are shown below.



1. How do the materials move in the bottles when they tip?
2. Roll the bottles. How do the materials move?
3. Shake the bottles. How do the materials move?
4. Do the materials in all of the bottles have some properties that are like water?
5. Do the materials in some of the bottles have different properties than water?

## Station 4: Comparing Sand and Water

Materials: 4 clear plastic cups, sand, water, paper towel, two trays, pennies

### Part A.

1. Fill a cup half full of water, and observe the surface of the water by looking from the side. Is it an even or uneven surface?
2. Place a penny on the surface of the water. What do you observe?
3. Pour a small amount of water on a small piece of paper towel. What do you observe?
4. Pour two small rows of water in the tray. Try to combine the rows to make one row of water. What do you observe?

## Station 4: Comparing Sand and Water

### Part B.

1. Fill a cup half full of sand. Observe the surface of the sand by looking from the side. Is it an even or uneven surface?
2. Place a penny on top of the sand. What do you observe?
3. Pour a small amount of sand on a paper towel. What do you observe?
4. Pour two small rows of sand in the tray. Try to combine the rows to make one row of sand. What do you observe?
5. Based on your observations, which properties do sand and water have in common? What properties are different?



## Station 5: Does Air Take Up Space?

Materials: Envelope, sealed quart-sized plastic bag, flexible straw

1. Place the plastic bag in the envelope. Does it take up space?
2. Remove the plastic bag from the envelope. Open the seal just enough to insert the straw. Using the straw, blow up the bag with air until it is full. Quickly remove the straw, and reseal the bag. Throw the straw away.
3. Try to put the plastic bag back in the envelope. Does it fit?
4. Press gently on the side of the inflated plastic bag. Does air take up space? How do you know?
5. What might happen if the bag bursts or is opened? Open a small part of the seal, and push on the bag until it is flat. Where does the air go?

## Station 6: Can Air Take Up Space in Water?

Materials: Clear plastic cup, paper towel, tape, and clear container of colored water

1. Wad up the paper towel, and attach it to the inside bottom of the cup with a piece of tape. Turn the cup upside down to make sure the paper towel is firmly attached to the inside bottom of the cup.
2. Push the upside down cup straight down into the bucket of water until it rests on the bottom of the bucket.
3. Lift the cup out of the bucket, keeping it upside down and as straight as possible.
4. Turn the cup right side up, and feel the paper towel. Explain the results.
5. Repeat the same steps, but tip the cup sideways while it is under the water before removing it. Turn the cup right side up, and feel the paper towel. Explain the results.

## Station 7: Does Air Have Mass?

Materials: two plastic bags, ruler with string loops threaded through each hole, binder clips



1. Hold up the ruler by suspending it from the string that is threaded through its middle hole.
  - Is it balanced?
  - How do you know?
2. Attach the binder clips to the string loops threaded through holes at each end of the ruler. Attach a plastic bag to each binder clip.
3. Hold up the ruler by the middle string again.
  - Is it still balanced?
  - What does this tell you about the two plastic bags?
4. Take one of the plastic bags off, and use a straw to blow it up. Reseal the plastic bag, and attach it back on the binder clip.
5. Hold up the ruler by the middle string again.
  - Is it still balanced?
  - What does this tell you about the balloon filled with air?
9. Is there another way to test or measure to find out if air has mass? Explain how you would do it in the space below.

# States of Matter

## Property Cards

Flows when poured
Shape does not change when it is moved
Piles up when poured
Spreads out when poured
Has mass

Holds the shape it is given
Spreads out and fills all of the space in any container
Has a flat, level surface when poured
Has mass
Supports objects that are stacked or placed on it

# States of Matter

## Property Cards

Flows and  
spreads to fill  
a container

Has no shape of  
its own

Can be squeezed  
into a very small  
space

May roll, slide, or  
stack

Takes up space in  
an open container

Holds the shape  
it is given until it  
is molded into a  
new shape

Spreads out and  
fills all of the  
space in any  
container

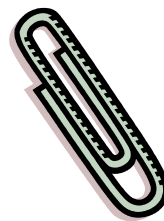
Has no shape of  
its own

Has  
mass

Takes up space in  
an open container

## Station 1

### The Flying Paperclip



1. Observe the paperclip.
2. What could cause a paperclip to fly in the air?
3. Pass a 3x5 index card between the arm of the balance and paper clip. Is anything holding them together?
4. Blow on the paperclip. Does the paperclip move?
5. Report your observations in your journal, using words and pictures.

## Station 2

### Stick To It!

Materials: plastic bag, penny, iron filings sealed in a petri dish, paper clip, safety pin, iron nail, aluminum foil, brass tack, twist tie, twig, rubber band, toothpick, tray, magnet

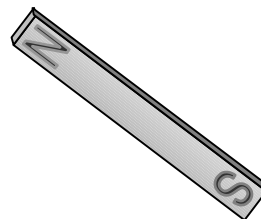
1. Place the items in the baggie on the tray.
2. Predict which items might stick to the magnet, and record in the chart.
3. Test each item, and record if it did or did not stick to the magnet.
4. Place objects that stick to the magnet outside the tray. Are these objects alike in any way?
5. Leave objects that do not stick to the magnet inside the tray. Are these objects alike in any way?
6. After testing all of the items, compare your predictions to the results of your tests. Were any of the results different from your predictions?
7. Circle your predictions that were different than the test results. (Remember that a prediction states what might happen in a test, and can be revised.) Are the circled objects alike in any way?

## Stick To It! Data Sheet

1. Predict which objects will stick to magnets, and record by circling Yes or No under the Predict column.
2. Test each object, and record by circling Yes or No under the correct column.

Object	Predict: Will it Stick?	Sticks to the Magnet	Doesn't Stick to the Magnet
Safety pin	yes or no	yes or no	yes or no
Copper Penny	yes or no	yes or no	yes or no
Nail	yes or no	yes or no	yes or no
Twig	yes or no	yes or no	yes or no
Aluminum Foil	yes or no	yes or no	yes or no
Rubber Band	yes or no	yes or no	yes or no
Paper Clip	yes or no	yes or no	yes or no
Iron Filings	yes or no	yes or no	yes or no
Brass Tack	yes or no	yes or no	yes or no
Toothpick	yes or no	yes or no	yes or no
Twist tie	yes or no	yes or no	yes or no

### Station 3 Push or Pull?



Materials: Bar magnets, ring magnets and holder

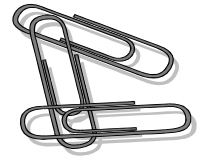
#### A. Bar Magnets

1. Place the ends of the bar magnet marked N close to each other. Record the results in your journal.
2. Place the ends of the bar magnet marked S close to each other. Record the results in your journal.
3. Place an end of the bar magnet marked N near an end marked S. Record the results in your journal.

#### B. Ring Magnets

1. Observe the four circular ring magnets. Do they have any markings?
2. Pull the red ring magnet away from the others. How does it feel?
3. Predict what might happen if the red ring is turned over before it is replaced next to the other magnets. Test your prediction. Describe how the magnet behaves.
4. Slide the ring magnets on the black holder so they all stick together.
5. Slide the ring magnets on the black holder so that they do not stick together.
6. Record the results in your journal.
7. Based on your tests, compare the properties of bar and ring magnets.

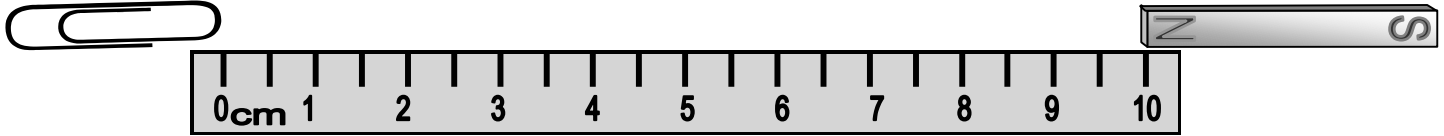
## Station 4: Pick Up Clips



Materials: Bar magnets, masking tape, bowl, paperclips, cm ruler

1. Measure the bar magnet in centimeters. Find the middle of the magnet, and mark it with masking tape.
2. Put the paperclips in the bowl.
3. Prepare a chart in your journal to record how many paper clips are picked up by the ends and the middle of your bar magnet in three trials.
4. Place the bar magnet horizontally over the bowl of paperclips, then pick it up carefully.
5. Count the number of paper clips that are attached to each end and the middle of the bar magnet. Record the results in your chart.
6. Which parts of the magnet seem the strongest?
7. Which parts of the magnet seem the weakest?

## Station 5: Which Magnet is the Strongest?



Materials: paper clip, centimeter ruler, small bar magnet, large bar magnet, cylinder magnet

Predict which magnet is the strongest, and record it in the chart. Follow these steps to test the magnets:

1. Place the end of the paper clip at the zero mark of the ruler.
2. Place the small bar magnet at the 10 cm mark on the ruler.
3. Slowly slide the magnet toward the paperclip until it attracts the paper clip. Record how many centimeters the magnet is from the paperclip when it attracts the paperclip, to the nearest centimeter.

Magnet	Distance from Paperclip
Ring Magnet	cm
Bar Magnet	cm
Cylinder Magnet	cm

Which magnet is the strongest?

What could you do to make the magnet test more reliable?

Design another test to find out which magnet is strongest. Record the test and the results in your journal.

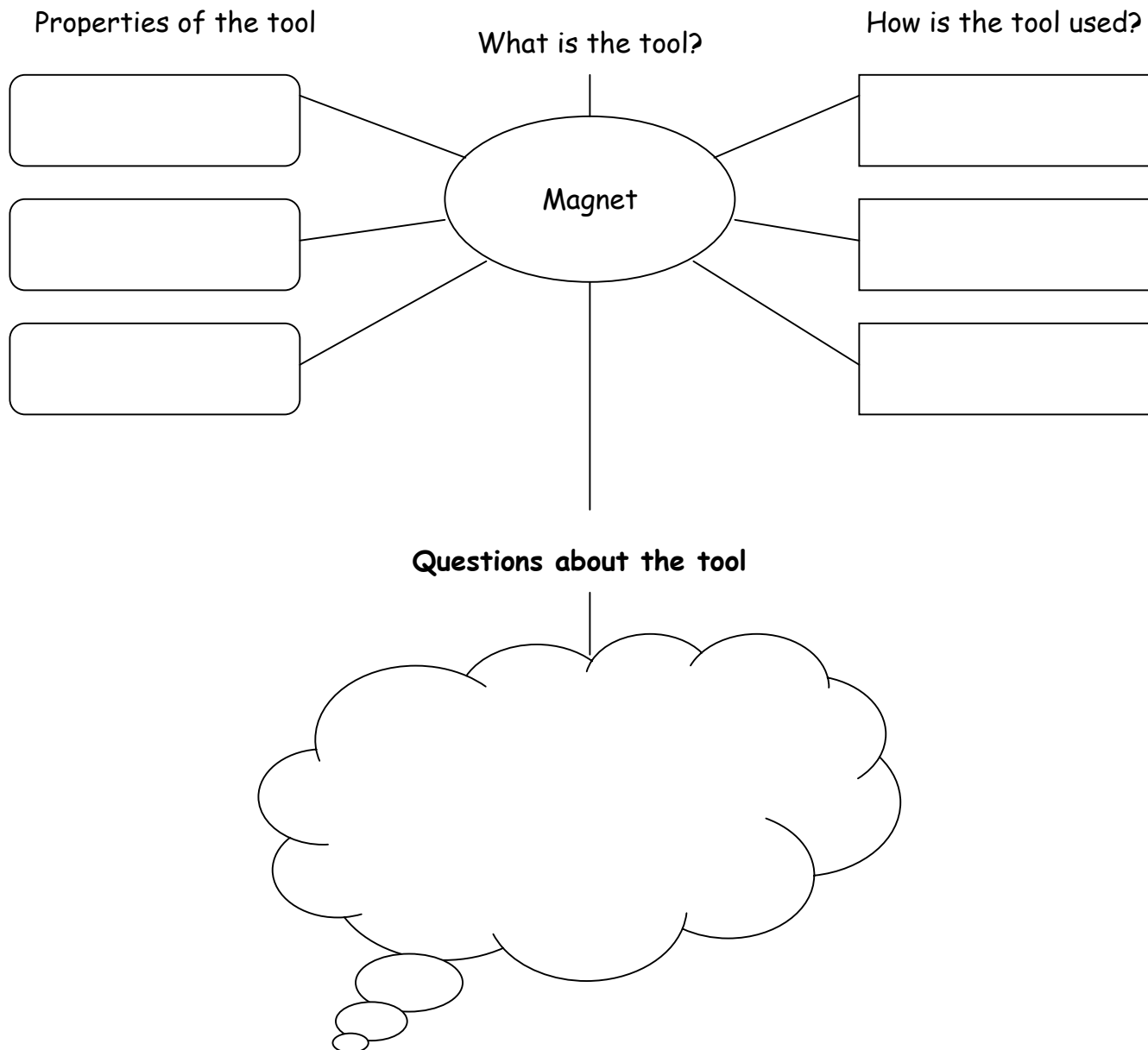
## Station 6: The Special Rock

Materials: Magnetite, baggie, toothpick, paper clip, penny, iron nail

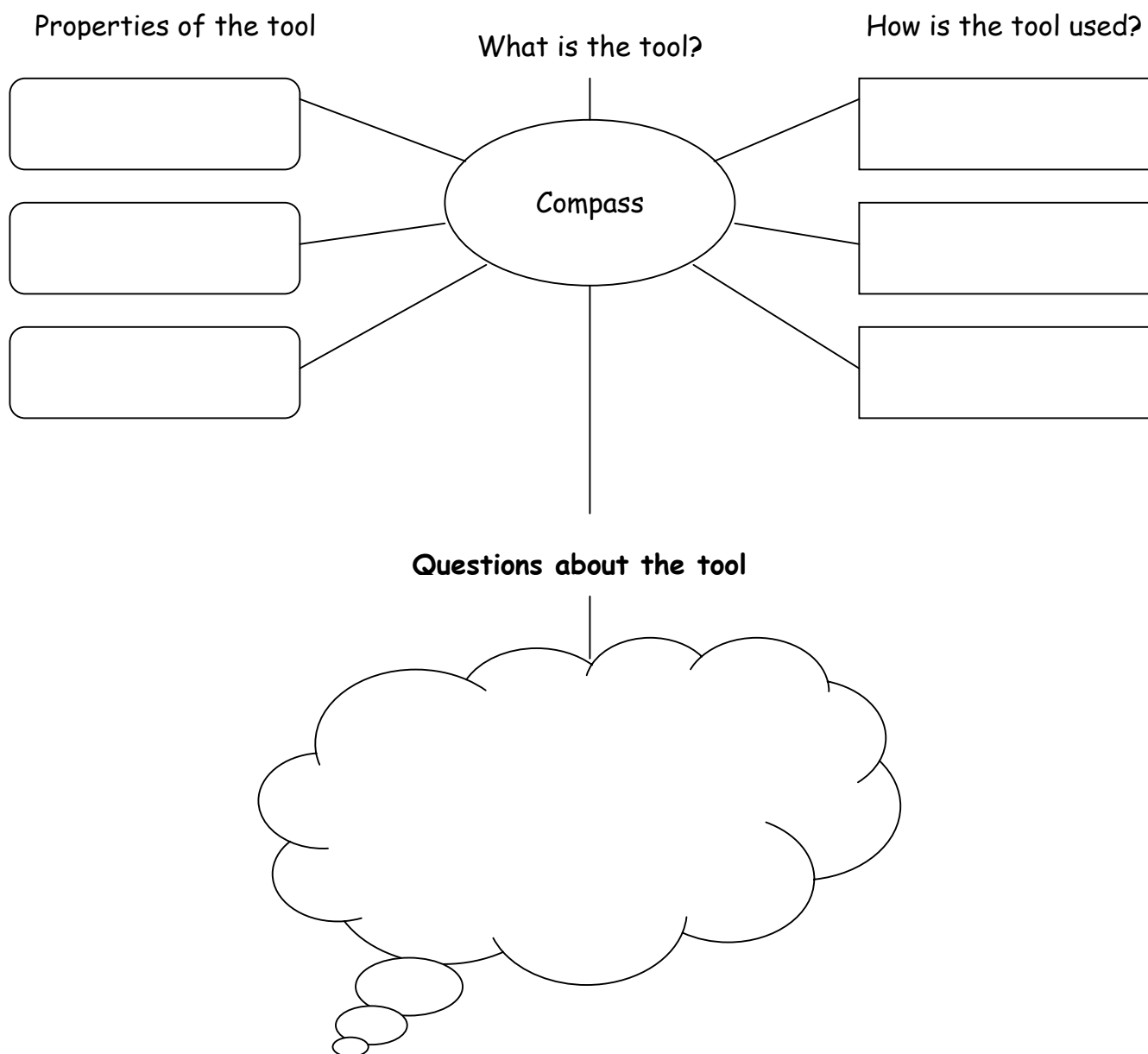
1. Pick up the rock, and observe it carefully. What are its properties?
2. How could you test the rock to find out if it has other properties?
3. Using the materials in the plastic bag, design and perform a test on the rock.
4. Record your test and observations in your science journal.

Name: \_\_\_\_\_

## TOOL CONCEPT MAP



# TOOL CONCEPT MAP



## Matter and Magnetism Assessment

1. A student discovered that when he placed two bar magnets ends close to each other, they pulled toward each other with a strong force. Which diagram below shows how the student placed the magnets? Bubble the letter of the correct choice.

- ☐ A      
- ☐ B      
- ☐ C      

2. A student placed a strong magnet near a penny, an iron nail, a brass tack, a steel wire, and an aluminum can.

Did the magnet attract any of these objects? \_\_\_\_\_

If so, which objects were attracted to the magnet?

\_\_\_\_\_

3. A student wanted to pick up as many paper clips as possible during his turn of the magnet relay race. His bar magnet was wider than the bowl of paper clips, so he placed the center of his bar magnet over the bowl. Did this student pick up more paperclips than a student who placed the end of her magnet over the bowl of paper clips? Explain your answer.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. A student tests a material to find out about its properties. The result of one of the tests is pictured below. What properties did the student discover about the material? What other tests could be done to find out more properties of the material?

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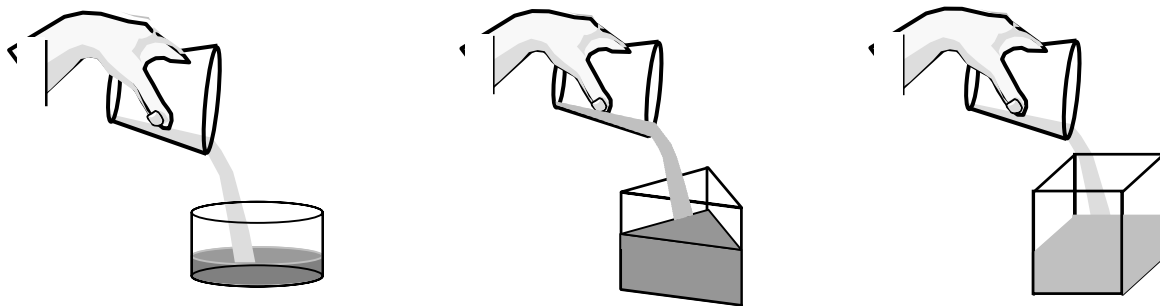
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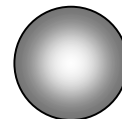
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1. Explain which properties of a material you could discover by using the tests shown below.



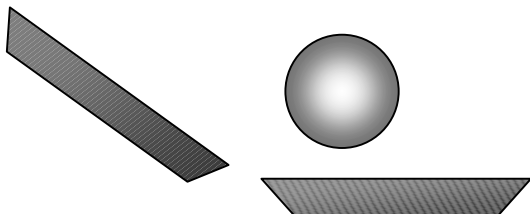
Test One: Roll the material into a round ball.

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Test Two: Place the ball on a balance.

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Test Three: Pour the ball from one pan to another pan.




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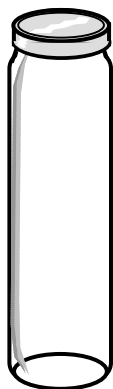
# Matter and Magnetism

## Performance Assessment

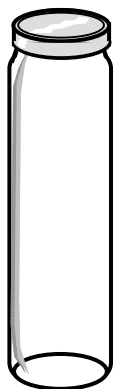
Materials: 3 plastic jars, bar magnet, sand, 3 paper clips, water

Find a way to remove the paper clip from the jar of sand, water, and air without touching the paperclip or putting the magnet in the jars.

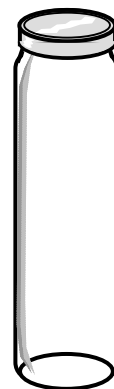
Draw your plan on each jar picture, showing how you will use the magnet.



Sand



Water



Air

Write the results of your tests below.

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I conclude that magnets can attract paper clips

through \_\_\_\_\_ because

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# Matter and Magnetism

## Scoring Rubric

Task	Criteria	
1. Properties of Magnets	Demonstrates understanding that: magnets attract metal objects that contain iron, magnets have two poles, magnetic force is stronger at the poles than in the center, like poles repel while opposite poles attract.	4
	Demonstrates understanding of most magnetic properties, with one omission.	3
	Demonstrates understanding of some magnetic properties, with two omissions.	2
	Demonstrates understanding of few magnetic properties, with three omissions.	1
	Demonstrates understanding of very few magnetic properties, with four omissions.	0
2. Properties of Matter	Demonstrates understanding that: Matter has mass and takes up space. Matter exists in 3 states: (1) Solids maintain their shape when moved into different containers, and take up a definite space; (2) Liquids flow when poured, and take the shape of their containers; (3) Gases have no shape and spread out to completely fill any container.	4
	Demonstrates understanding of most properties of matter, with one omission.	3
	Demonstrates understanding of some properties of matter, with two omissions.	2
	Demonstrates understanding of few properties of matter, with three omissions.	1
	Demonstrates understanding of very few properties of matter, with four omissions.	0
3. Matter and Magnetism Performance Assessment	Solves the problem, and clearly communicates the solution in words and pictures. Demonstrates and communicates deep understanding of the properties of matter in solid, liquid, and gas forms, and properties of polarity by using ends of magnet to attract the paper clip.	4
	Solves the problem, and communicates the solution in words and pictures. Demonstrates and communicates a basic understanding of the properties of matter in solid, liquid, and gas forms, and properties of polarity by using ends of magnet to attract the paper clip.	3
	Solves the problem, and communicates the solution in words and pictures. Demonstrates and communicates misconceptions about the properties of matter in solid, liquid, and gas forms, and properties of polarity by using the middle of the magnet to attract the paper clip.	2
	Makes an attempt to solve problem, but the solution is incomplete. Needs more experiences to understand properties of matter and magnetism.	1
	Does not attempt to solve problem.	0

## Lab Skills, Safety and Journaling

Task	Criteria	
3. Lab Skills, Safety, and Participation	Selects and uses appropriate equipment with care and proficiency. Handles magnets and compass with great care. Listens attentively, and stays actively involved in each activity.	4
	Uncertain about equipment selection, but uses equipment carefully. Handles magnets and compass with care. Listens to instructions and stays involved, but may wait for others to lead.	3
	Is not familiar with use of equipment, so often makes inappropriate choices, but does not abuse equipment. Handles magnets with care, with reminders. Distracted during instructions, so must rely on others for directions.	2
	Uses equipment improperly, and is haphazard and disorganized. Needs to review rules for safe handling of magnets. Is distracted during instructions, and needs constant reminders to stay on task.	1
	Does not use equipment or abuses equipment. Handles magnets carelessly. Is disruptive during instructions and activity.	0
4. Matter and Magnetism Science Journal	Contains very detailed entries and labeled drawings that clearly communicate each learning experience, no omissions. Makes relevant inferences and connections with matter and magnetism concepts. Very neat and well organized.	4
	Contains detailed entries and labeled drawings that communicate each learning experience, with one omission. Asks relevant questions, and makes inferences and connections with matter and magnetism concepts. Neat and organized.	3
	Contains fairly detailed entries and drawings, with two omissions. Asks questions, and makes some inferences and connections with matter. Neat, but may need to spend more time organizing entries.	2
	Contains some entries and drawings, with three omissions. Asks few questions, and makes few inferences and connections with matter concepts. May need to spend more time on neatness and organizing entries.	1
	Contains minimal entries and drawings, with four or more omissions. Makes no inferences or connections with optical systems concepts. Needs to spend more time on neatness and organizing entries.	0